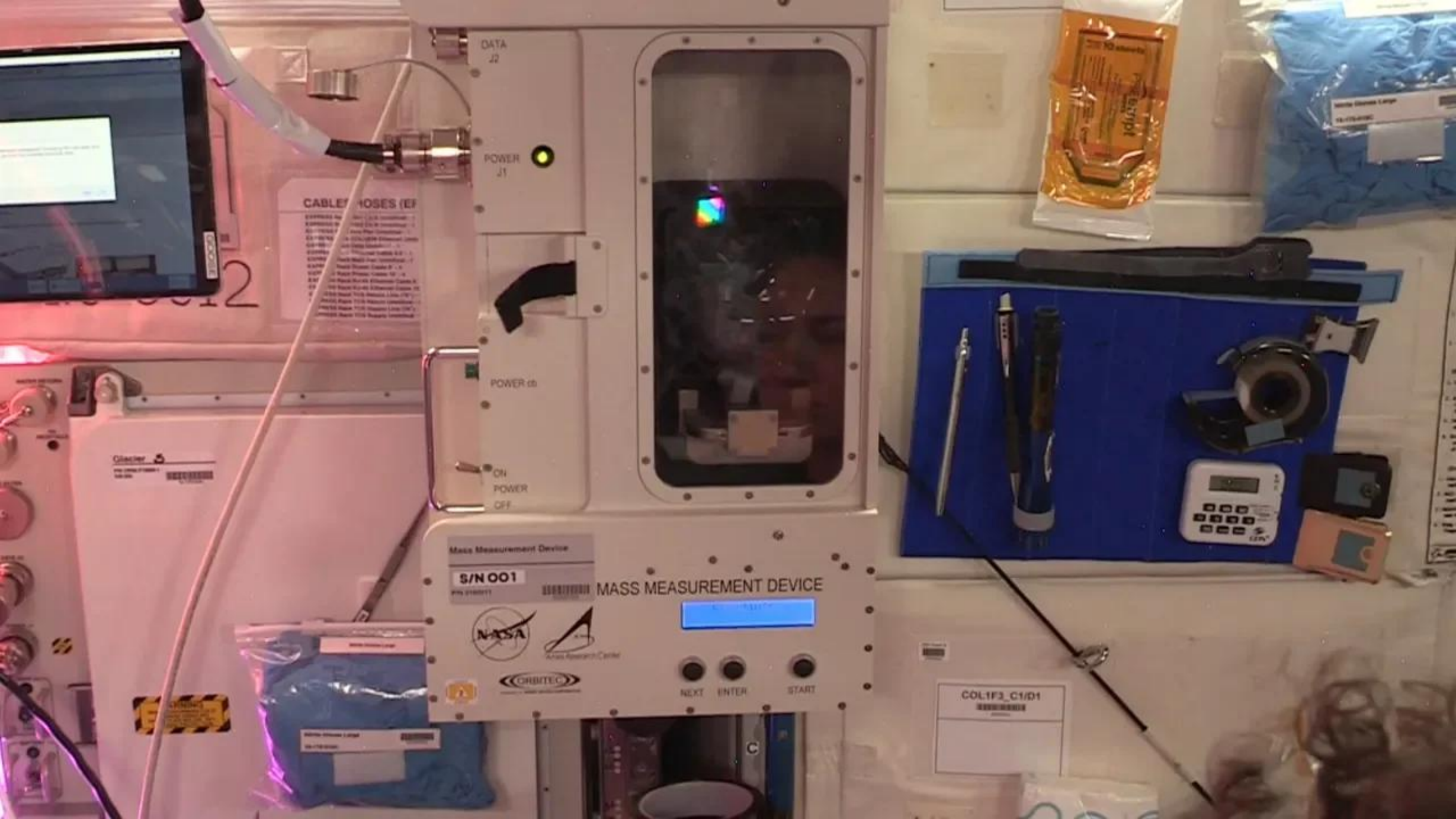
DATA
J2
POWER
J1
POWER
ON
POWER
OFF
Mass Measurement Device
S/N 001
MASS MEASUREMENT DEVICE
NASA
ORBITEC
NEXT
ENTER
START
COL1F3_C1/D1

1
00:00:10,459 --> 00:00:08,000
at home many people can and do weigh the

2
00:00:15,049 --> 00:00:10,469
food they eat it's as easy as putting it

3
00:00:18,019 --> 00:00:15,059
on a scale but scales don't work without

4
00:00:20,210 --> 00:00:18,029
gravity so how do astronauts measure the

5
00:00:22,340 --> 00:00:20,220
weight of small items in a microgravity

6
00:00:26,509 --> 00:00:22,350
environment like the International Space

7
00:00:27,200 --> 00:00:26,519
Station they measure mass instead what's

8
00:00:30,109 --> 00:00:27,210
the difference

9
00:00:32,900 --> 00:00:30,119
mass is the measure of how much matter

10
00:00:35,569 --> 00:00:32,910
something contains weight on the other

11
00:00:38,030 --> 00:00:35,579
hand is the measurement of the pull of

12
00:00:40,250 --> 00:00:38,040
gravity on an object we can actually

13
00:00:42,650 --> 00:00:40,260

know how much our plants are weighing

14
00:00:44,180 --> 00:00:42,660
that the astronauts will consume so they

15
00:00:46,279 --> 00:00:44,190
use the Newton's second law of motion

16
00:00:49,639 --> 00:00:46,289
which has force mass and acceleration

17
00:00:54,709 --> 00:00:49,649
under the same amount of force an object

18
00:00:57,860 --> 00:00:54,719
with more mass will accelerate less so

19
00:01:01,790 --> 00:00:57,870
to apply this in space astronauts use

20
00:01:04,340 --> 00:01:01,800
that mass measurement device mm D which

21
00:01:07,190 --> 00:01:04,350
launched to the space station in 2017

22
00:01:09,289 --> 00:01:07,200
they then put these plant samples inside

23
00:01:11,149 --> 00:01:09,299
a little ziploc bag and then the mass

24
00:01:14,000 --> 00:01:11,159
measurement device goes back and forth a

25
00:01:17,090 --> 00:01:14,010
few times the mo D applies a known

26
00:01:20,090 --> 00:01:17,100
acceleration to the sample and measures

27
00:01:22,850 --> 00:01:20,100
the resulting force allowing the system

28
00:01:25,730 --> 00:01:22,860
to determine its mass it can measure

29
00:01:29,359 --> 00:01:25,740
between 1 and 100 grams and has an

30
00:01:31,039 --> 00:01:29,369
accuracy of 0.1 grams it's wonderful

31
00:01:34,580 --> 00:01:31,049
it's really really accurate so it's it's

32
00:01:36,890 --> 00:01:34,590
a great new tool that we have there are

33
00:01:38,929 --> 00:01:36,900
multiple mass measurement devices on the

34
00:01:41,330 --> 00:01:38,939
space station they measure everything

35
00:01:43,999 --> 00:01:41,340
from astronauts who are monitoring their

36
00:01:46,330 --> 00:01:44,009
health to freshly harvested produce from

37
00:01:49,249 --> 00:01:46,340
the station's veggie growth chamber

38
00:01:52,100 --> 00:01:49,259

so when microgravity makes it impossible

39
00:01:53,440 --> 00:01:52,110
to tip the scales its mess that matters